EXHIBIT 1

Impact of Calling Party Pays CPP on Systems Infrastructure

A White Paper

Developed for PCIA

By: DETECON, INC.
10700 Parkridge Blvd., Suite 100
Reston, VA 20191-5429
(703) 476-4800

Table of Contents

DETECON INC
10700 Parkridge Blvd, Ste 100
Reston VA 20191

Executive Summary

The successful implementation of Calling Party Pays (CPP) for wireless telecommunications services could be beneficial for the industry. To be successful, CPP must be embraced by the operators and providers of wireline and wireless services and accepted by the calling party. It must also be capable of implementation by large and small carriers alike. The White Paper provides an analysis of the key issues that will face the industry in implementing CPP *as prescribed by the FCC*. It also explores alternatives that might be available and assesses their impact on the overall implementation of CPP. A careful review and analysis of the issues raises some significant considerations regarding CPP implementation. These issues and considerations are addressed in the key findings discussed below.

Finding 1 Fundamental marketplace and CPP implementation differences makes CPP implementation more complex and costly in the United States.

One of the overarching considerations that must be presented in understanding the implications that wireless CPP will have in the United States is that the US is different from other countries in regards to the marketplace and the proposed CPP implementation.

On the marketplace level, the principal impacting differences lie in two areas. First, there is the charging structure for telecommunications services. In most countries outside of the United States, customers are used to "metered" telephone service. They pay for each minute (or pulse) every time they place a call. Therefore, wireless CPP was an easy overlay for the marketplace. The only difference for the customer was that the charge per minute or pulse may be higher. The United States does not have the same charging structure. Here "flat rate" telephone service whereby unlimited local calls are included in their monthly service charge is the norm. As a result, the implementation of wireless CPP will not only mean a higher charge, but it will mean charging for a call that is often included in the service charge.

The second marketplace difference is the fact that the US has multiple carrier-to-carrier and carrier-to-customer relationships that simply do not exist elsewhere. For example, while other countries have long distance carriers and wireless service providers, all billing responsibility rests with the originating network operator. This greatly simplifies the number of carriers a calling party must work with on a monthly basis. In fact, when wireless service was introduced, no additional carrier-to-customer relationship was established because the calling party maintained the relationship with the originating network operator. No relationship with the CMRS provider was required.

In the US today, the calling wireline party is a customer of the local fixed operator for their local service and the long distance carrier for their long distance service. For wireline calls to a CMRS subscriber, the calling party needs no relationship to the CMRS provider, because the wireless party pays for incoming usage charges. The introduction of CPP, as described in the FCC *Notice*, becomes more complex in the US because it involves the calling party establishing a relationship with the CMRS provider. Now instead of the calling party being a customer of just the local and long distance carrier, he or she will also be a customer of the CMRS provider.

The second major differentiating factor is related to the proposed US CPP implementation process compared to how it was implemented in most other countries. These characteristics include the fact that in the US, CPP will be optional, there are no plans to use an easily recognizable number to identify the CPP subscriber. There are extensive caller notification

requirements. No other country has implemented CPP in this way. The fact that this is planned as an optional service is not in and of itself the issue. Rather, it is a combination of these implementation requirements that makes it more complex. The combined affect results in the need for databases and AIN architecture on the part of each CMRS provider. The additional costs of implementing these requirements could result in the inability of smaller carriers to introduce CPP.

As a result of these marketplace and CPP implementation differences, CMRS providers in the US will have to incur additional network and billing systems infrastructure costs. Wireless carriers in other parts of the world, whether they converted to CPP or were always CPP, did not incur such costs.

Finding 2 Participation by all interested parties is required to insure non-discriminatory access to CPP for the calling party and economic viability for CMRS providers.

Successful CPP implementation requires a willingness on the part of all interested parties (i.e. ILECs, IXCs, CLECs and CMRS providers) to participate in the process. A lack of full participation will result in disparate access for the calling party and cost inefficiencies for the CMRS providers.

For select calling parties, lack of Originating Carrier participation translates into blocked calls or cumbersome call set-up dialogues for calls to CPP subscribers who have selected the CPP option. This situation arises because the party responsible for the billing (the CMRS provider) does not have billing information (name and address) on the calling party. The billing information resides with the originating subscription carrier. The CMRS with billing responsibility will be able to obtain this information from all ILECs, however, there is no such guarantee for calling parties of the CLECs, IXCs, or other CMRS providers. Therefore, without participation of all carriers in this process, the CMRS provider with billing responsibility will have to either block the call or require a credit card to complete calls from some calling parties.

From the perspective of the CMRS provider, full interested party participation is crucial. The CMRS provider has billing responsibility for what amounts to a casual caller. Establishing billing, customer care and collections processes for these casual callers can become cost prohibitive for the CMRS provider. This is due to the underlying cost structure associated with creating a bill for a caller who might have only a couple of calls to a CMRS provider's subscriber. In those cases, the cost of the end-to-end billing and collections process might far outweigh the revenues collected from the calling party. This can be ameliorated to some extent through a 3rd Party arrangement where a single 3rd Party acts as a clearinghouse for all CMRS calls.

Neither of these alternatives can compare to the cost savings that can be realized by having the originating carrier (i.e. LEC, IXC, or CMRS) bill on behalf of the terminating CMRS provider. The originating carrier is already billing the calling party and this would become an incremental cost. However, the true costs savings for wireless CPP can only be realized in this instance if there is cooperation from all interested parties to enter into billing and collections arrangements that reflect the nature of the cost relationship for billing the CPP calls. Short of the participation, many CMRS providers may find that the costs of CPP far outweigh the benefits.

Finding 3 Substantive billing and collection issues arising from the proposed CPP implementation will impact customer and carrier acceptance of the service.

Under the proposed CPP implementation for the US, the billing ownership will rest with the terminating CMRS provider. Given the customer-to-carrier relationship, this underlying principal raises significant billing and collections issues that could ultimately impact the acceptance of the service. This is true because having the CMRS provider responsible for billing means that what is essentially a "casual call relationship" must be transformed into a "subscription-like relationship". This results in added costs for the CMRS provider and increased customer inconvenience and confusion.

From the CMRS providers perspective it raises issues in terms of loss of scale, increased bad debt risk and increased customer care call volume. Each of these adds to the cost for the CMRS provider. Since the CMRS provider has CPP billing responsibility, they must now generate a significantly larger number of invoices (many with a small number of calls) in order to bill the same call volume they have today. When one considers the scale benefits inherent in the billing and collections process, this could have a significant negative impact for the carrier.

Higher bad debt risks are also an issue. With little influence over the calling party, the bad debt and uncollectible risks are much higher than they are for their own subscription customers. Finally, there is the issue of the costs associated with a significant call volume increase into the customer care call centers. It will increase as CMRS providers handle calls from both the called party (the CMRS subscriber) and multiple calling parties to that same CMRS subscriber.

From the calling party's perspective, having CPP billing responsibility rest with the CMRS provider is also problematic. The issue for the calling party is a potential need to send payments to multiple providers. For example, a calling party who places calls to subscribers of four (4) different CMRS providers during the month could receive up to six (6) telecommunications bills. This might include one from the LEC, one from their IXC and one each from the four (4) CMRS providers. This is very likely to add to irritation and confusion.

There are alternatives that might help to reduce some of the issues raised for both the CMRS providers and the calling party. For example, the use of a single 3rd Party by all CMRS providers could offer some billing cost scale benefits and improve bad debt risk for the CMRS provider. It would also minimize the number of bills generated for the calling party as calls could be "grouped" together for all CMRS providers. However, this would assume that all CMRS providers use a single 3rd Party and, depending on the cost, might not be the best alternative.

Another possibility would be to have the originating subscription carrier (i.e. LEC, IXC or CMRS), perform billing and collections processes on behalf of the CMRS provider of the called party. As previously discussed, this alternative has the potential to offer the best solution. The benefits associated with scale can be fully realized under this alternative, as this becomes an incremental cost for a carrier that is already sending a bill to that same customer. It is also likely to reduce bad debt risk, as the calls will be grouped together. From the perspective of the calling party, this alternative will result in a single bill.

However, there are impediments to this alternative. First, scale benefits will only be realized if the carriers negotiate in good faith, based on an incremental cost basis. It also would require a willingness of all interested parties to participate in the process. To date there is no indication that all interested parties are willing to participate. Finally, this alternative works best when CPP customers have an easily recognizable number. Short of that, CMRS providers would have to provide billable records to the Originating Subscription Carriers; otherwise major changes would be required to their billing systems.

In all of the international CPP implementations studied in this analysis, including those where there was a conversion from Wireless Party Pays to CPP, these issues do not arise. This is so because the relationship with the calling party is always with the originating network operator, as is the Billing, Collections and Customer Care ownership. *This is true whether the retail rates for the call are set by the CMRS provider or by the originating network operator.* This is an option for the US market and it is explored in this paper.

Company Profile

DETECON is a Telecommunications Engineering and Management Consultancy with a 200 million dollar annual turnover and more than 900 technical experts worldwide. It was established in 1977 as an independent company specializing in engineering, consultancy and investment projects in the communication and information sectors.

DETECON'S expertise in science, engineering, marketing and economics was developed through over twenty years of working in the industry. The Company makes this knowledge available to companies, organizations and administrations worldwide, which plan, finance and operate telecommunications networks and systems.

While DETECON's experiences span the broad spectrum of telecommunications technologies and business applications, a great deal of its specialized expertise is in the design, engineering implementation and operation of wireless networks worldwide. In this context, its experts have significant knowledge concerning the effects on the network, as well as associated operations and billing systems of various service offerings. The various ways that Calling Party Pays has been proposed, and actually implemented, in wireless companies around the world, is an area of activity familiar to the Company's experts.

Bios

Alfred F. Boschulte

DETECON Inc.'s President and CEO, Alfred Boschulte, is a proven leader in the telecommunications industry with over thirty years of experience. He has overseen the achievement of significant growth and change in key leadership positions as President and Chairman of NYNEX Mobile Communications and as the Managing Director of a national GSM cellular Licensee in Indonesia.

Noreen Conlon

Noreen Conlon is a Senior Consultant for DETECON and has held key management positions throughout her twenty seven-year career with NYNEX and Bell Atlantic. During this time, she

developed a dual experience background in Network Engineering and Operations and in Information Technology. She held key technology leadership positions that included Chief Information Officer and Director of GSM Engineering and Operations for a national GSM operator in Indonesia. Prior to this she was Vice President-Information Systems and Vice President-Technical Services for NYNEX Mobile. Ms. Conlon has experience in start-up operations, joint venture management, and diverse managerial and operational expertise.

James H. Herbert

Jim Herbert has been in the telephone business since 1964. From the time he started his first position with the Commercial Department of Ohio Bell to the present position with DETECON, he has performed key functions for wireline and wireless telephone companies both here and abroad. He has held significant positions with hardware and software vendors to both wireline and wireless operators, and he has consulted for both of the above. Along the way Jim has served as General Manager of Ohio operations of the Mid Continent Telephone Company, Director of Bell Marketing of Northern Telecom's Network Support System's Division, Executive Vice President and Co-founder of Phoenix Telecom and President of US Telecom's Advanced Technology Systems Division. Jim is a graduate of Case Western Reserve University.

Susan Tucker

Susan Tucker has more than thirteen years of wireless telecommunications industry experience. Prior to consulting for DETECON, she was the GM of Marketing and Sales Planning for a GSM Cellular provider in Indonesia. During that time, she was responsible for the marketing initiatives for the launch of a start-up operation, including, brand design and launch, distribution channel strategy, product and pricing initiatives and marketing research. In addition, while at NYNEX Mobile Communications, she held management positions in several functional areas and has experience in strategy development, wireless public policy and regulatory, sales and customer service. Ms. Tucker has an MBA in Marketing Management from Pace University.

1.0 Objective and Background

1.1 Objective

On June 10, 1999 the Federal Communications Commission ("FCC") adopted a *Declaratory Ruling and Notice of Proposed Rulemaking for Calling Party Pays Service Offering* ("CPP NPRM") in the Commercial Mobile Radio Services ("CMRS"). The objective of this paper is to examine the impact of major elements of the Calling Party Pays ("CPP") Notice of Proposed Rulemaking's ("NPRM") implementation on the systems infrastructure, including cost and feasibility.

1.2 Background

Telecommunications, both in the US and elsewhere in the world, has been implemented under the concept of calling party pays. If you place a call, you pay for all the charges associated with that call. There are only a couple of exceptions to that rule. The major exception is the US Wireless Party Pays concept. Since inception, callers to wireless subscribers have not paid the full charges associated with that call. Most of the charges were and are borne by the wireless subscriber – the Call*ed* Party. The FCC is now considering rules that would enable CMRS providers to offer Calling Party Pays to their subscribers.

Calling Party Pays, as envisioned in the FCC CPP NPRM has several key elements which will have a significant impact on its implementation. Those elements include the fact that it is optional, that it does not currently contemplate a separate telephone number as an identifier, that it requires a detailed caller notification and that the CMRS provider has sole billing responsibility. Taken individually, these elements may not present a problem, but when combined, they can raise some very significant implementation issues.

One might look to the International CPP model as a framework for its implementation in the US. Throughout Europe and Asia, wireless telecommunications was implemented under the calling party pays model. Since inception, callers always knew that they would be responsible for paying all of the charges associated with a call to a wireless subscriber. There were several underlying factors that were present that enabled CPP implementation including the fact that metered telecommunications services were the norm, there was never a separate caller notification and wireless subscribers were easily identifiable through a separate telephone number. It is also important to note that, when implemented, billing responsibility for CPP rested with the Originating Network Operator.

There were other countries that implemented wireless service under a wireless (or mobile) called party pays model. This occurred for the most part in Latin America. Several of these countries have recently moved from a wireless party pays (like the US) to introduce a CPP option as a "default" service. Like Europe and Asia, metered telecommunications services were the norm, for the most part wireless subscribers were easily identifiable through a separate telephone number and billing responsibility for CPP rested with the fixed operator (i.e. the local fixed operator). A separate caller notification requirement was only found in one of the countries reviewed for this paper and that was later removed.

The US version of CPP appears to be quite different from any of the International Models discussed. Table 1 contrasts the proposed US CPP implementation with that of the rest of the world. It explores the major characteristics of the International CPP implementation and compares it with the proposed US model.

Table 1: Underlying Characteristics of CPP Implementation[1]

Characteristic	International CPP	Proposed US CPP
CPP is non-optional or default service	**Yes**	**No**
Easily recognizable wireless number (either separate area code or prefix)	**Yes**	**No**
Originating Operator bills and owns receivables	**Yes**	**No**
Billing for local calling is generally metered	Yes	No
Calling Party notification generally not required	Yes	No
CPP charging model is simple	Yes	TBD
Called CMRS responsible for roaming and call forwarding charges	Yes	Yes
CMRS compensated through interconnection	Yes	No
Calling Party has relationship with one party and receives one bill	**Yes**	**No**
CPP ranges from local to national	Yes	TBD

The characteristics highlighted (in bold text) in the chart above are particularly significant to CPP implementation. Their significance is best illustrated with several examples. For example, the fact that CPP will be implemented as an optional service, without easily recognizable numbers will require additional network functionality (i.e. database of CMRS customers with CPP option). Another might be the fact that CPP is established with the CMRS provider as the party having billing responsibility instead of assigning that to the originating operator. This can create billing complexities that are particularly onerous for the customer (i.e. may require multiple bills for one call to one calling party).

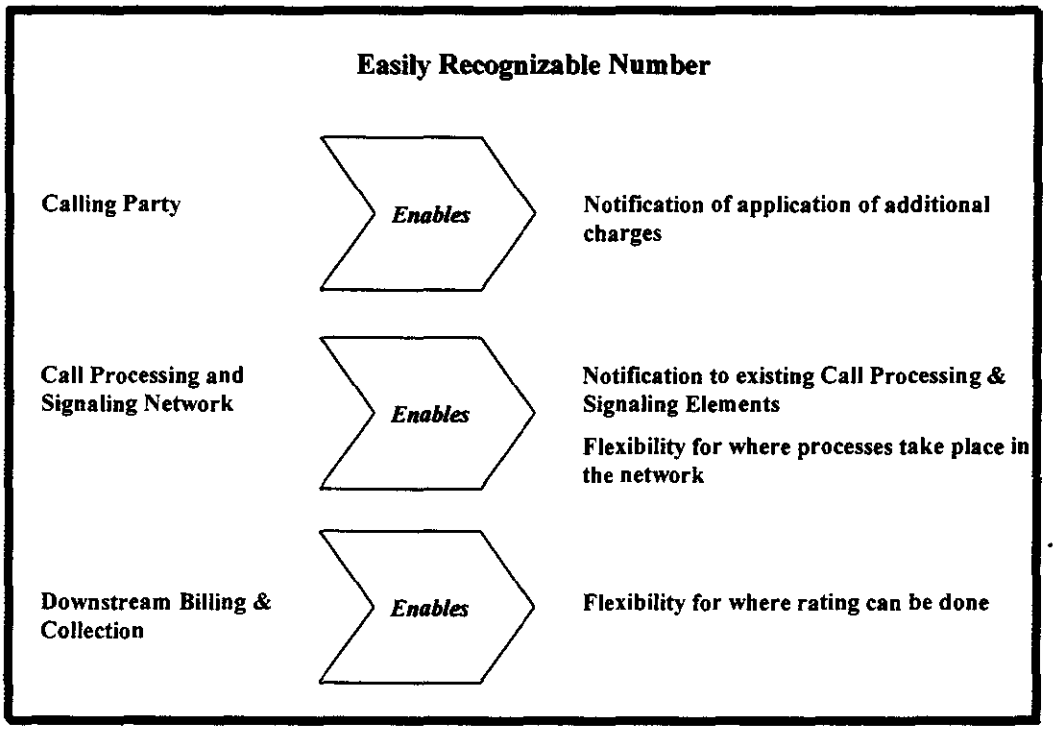
Several of the characteristics being considered in the CPP implementation approach for the US may add to its complexity. Since no other country has implemented CPP in the same fashion, the final outcome is difficult to determine at this time.

Each of the characteristics will be discussed in greater detail in Section 3 of the White Paper. However, one characteristic is particularly important to understand - Easily Recognizable Numbers (ERNs). ERNs serve as enablers for CPP implementation. In fact, ERNs were either in place or put in place at the time of CPP implementation in all of the International models reviewed in this Paper.

[1] Source: Calling Party Pays: International Case Studies, The Strategis Group.

Diagram 1 illustrates the pivotal role that ERNs play in CPP implementation.

Diagram 1: ERN as CPP Enabler



The ERN serves as an enabler in several areas of the process. For the Calling Party, it provides a mechanism for notifying them that additional charges apply for the call. On the network front, ERNs provide an early notification to the signaling and call processing elements that it is a CPP call. This significantly reduces the number of required database queries. The ERN also allows flexibility for where the database can be placed in the network (i.e. at call origination point, call termination point or a common network resource that can be located anywhere), subject to notification requirements.

It also provides flexibility for call rating. The ERN easily allows either the originating carrier or the terminating carrier to rate the call. In fact, without an ERN, originating carriers would be required to build a new database and redesign their existing billing system. Most billing systems today are not capable of billing at the 10-digit telephone number range, which would be needed if CPP were implemented without the use of an ERN or otherwise dedicated NPA NXX ranges.

2.0 Introduction

There are two principal components to the CPP implementation solution - business relationships and systems. The White Paper undertakes an analysis of how both components impact the successful implementation of CPP as proposed in the NPRM.

CPP implementation involves an understanding of the business relationships between multiple carriers, their associated customers and third party solution providers. The proper determination of these relationships will have a significant impact on the successful implementation of CPP. For purposes of this discussion, these relationships are identified and described as business models. Today there are two principal business models in place. One is the model typified by the United States, which is described here as Wireless Party Pays. The second is a model more commonly found in Europe and Asia which are identified as the International Calling Party Pays Model (Sent Paid). Presented in this paper are two proposed business models that represent different ways of viewing relationships in the context of the CPP implementation being considered by the FCC. The two Calling Party Pays Business Models explored in this paper are the Bill Direct and Sent Paid (modified for the US) Models. Each business model is described and discussed in relation to its impact on CPP implementation.

The second crucial component is the systems infrastructure. For purposes of this analysis and discussion, systems infrastructure includes the elements that fall into three major categories: Call Processing, Signaling, and Billing, Collection and Customer Care Systems. Each systems component is described and discussed in relation to its role in CPP implementation.

It is worth mentioning that all of the discussions, business and technical considerations have focused on the handling of voice traffic only. There has been essentially no consideration of non-voice traffic, including data, (multi-media) e-mail and messaging services. It is particularly important to consider the potential implications of data services since it is highly probable that networks in the near future will rapidly migrate to packet based which will be permanently connected to the Internet. This fact, along with the implementation of voice over data, will obsolete any technical solutions for handling CPP if they depend on technology serving a circuit switched network without considering data.

2.1 Business Models

The White Paper provides an analysis of CPP implementation in the United States through a discussion of four business relationship models. The first two models explore the current situation in the US contrasted with what takes place elsewhere in the world. They help to provide a framework for the discussion of the final two potential US CPP business models. The third business model depicts what is believed to be a representation of the CPP implementation contemplated by the FCC and the final model outlines a potential business relationship alternative.

2.1.1 USA Business Model (*Status Quo*): Wireless Party Pays

The Wireless Party Pays Model, *Status Quo* (Figure 1) describes the business relationships currently in place in the United States.

As a preface to the discussion of the model for the way business is done in the United States today, it is important to explain telecommunications in the context of what is already in place, and contrast that marketplace with those areas in the world with which we will compare ourselves. At the time wireless communications was introduced in the United States, wireline communications was already developed to the point where the US market for telephony was the largest total market in the world. Virtually every business and far in excess of 90% of the residential locations were already equipped with telephone service. The "universal service" concept was fully accepted as a fact, and there was little difference between the rural and urban populations in terms of types or quality of services.

Telephone service was flat rate for calls within the immediate area of the caller. The number of or the duration of the calls one made had no bearing on the price one paid for the service. The only calls one paid extra for were long distance calls. In that case the calling party always paid for the call unless there was either a preparatory notice given, in the case of collect or third number calls, or a pre-arrangement was made for a different party to pay for the calls, such as 800 number or calling card. Following the break up of the Bell System, with the advent of many interexchange carriers, the fundamental paradigm for the relationship with the customer changed somewhat. Options were now available for the customer and the customer, because of the additional customer-carrier relationships that were established, experienced new billing relationships.

The introduction of wireless service in the United States did not change the conditioning for wireline customers. A wireline customer had no way of knowing, and had no need-to-know that the party they were calling was a wireless customer. The charging paradigm and the customer service provider relationship was exactly the same as before wireless was introduced.

The initial charging and rating packages that were provided to the wireless customer by their service providers did introduce an entirely new lexicon of service and charging elements. Wireless customers now experienced airtime, roaming and terminating airtime charges in addition to their regular subscription service charges. While there was a significant difference in the kind of services provided, the market accepted a significant distinction in the way rates and charges were levied.

Keeping that background in mind, Figure 1 describes the USA Business Model, which is referred to as Wireless Party Pays. The process of the call, from call initiation to call set-up flows from left to right in the diagram. The top half of the diagram describes the relationship in the process and aftermath of the call, between the subscriber and the carrier who is involved in the transport of the call. The bottom half of the page describes business relationships among the carriers in the process of transporting the call.

The example used in Figure 1 is a long distance call placed by a landline caller to a CMRS subscriber located in their home system. In that case, the wireline calling customer pays for that which they have always paid for, the origination costs associated with the call, and the "long distance" charge. The call origination portion is part of their flat rate. With the long distance piece, the customer has been conditioned to expect an extra charge because they have dialed "1". For all practical purposes, the "1" is the Notice to the customer that an extra charge

applies. By the same token, the called customer (the wireless customer) pays for that portion of the call for which they have contracted with their CMRS provider. The individual wireline and wireless carriers have interconnection agreements in place, which facilitate and enable the individual customers to call one another.

In the USA Business Model – Wireless Party Pays, there is one call, two bills, and two people paying the individual bills. The calling party gets a bill from their long distance carrier, (possibly in the same envelope as their LEC bill). The called party (the wireless customer) gets a bill from their CMRS provider for terminating airtime and roaming charges, if appropriate.

2.1.2 International Business Model (*Sent Paid*): Calling Party Pays

The International Calling Party Pays Model, *Sent Paid,* (Figure 2) describes the business relationships currently in place in Europe and much of the rest of the world. It is quite different for the USA Business Model. The differences are best explained in the context of the development of the telecommunications market. Europe is representative of most other countries in regards to CPP and will be used here for illustrative purposes.

The telecommunications environment in Europe is quite different than the US, and the evolution of the market has conditioned customers in a very different way. Until quite recently, the market in Europe was characterized by national PTT's controlling the telecommunications market as a government monopoly. The monopoly was total, including local service, national long distance and customer premise equipment. The earliest additions of wireless services were initiated by national companies, some of which were either totally, or partially owned or controlled by the National PTT. From the beginning of wireline service, the calling party paid for all calls, and every call, individually. In earlier times, the charge for calls was based on a meter in the central office. The farther one called the faster the meter ran, and the meter ran for as long as the call lasted. The only difference between "local" and "long distance" was the speed of the meter.

Even though competition has been introduced into the European market and there are many long distance companies, a few fixed line operators, and a growing number of wireless providers, the basic plan of a single fixed line operator being the primary provider for the fixed line customer has remained the same. The fixed line provider serves as the point of contact for the fixed line customer for all transactions initiated by the fixed line customer and on behalf of any other carriers who may be involved in the transport of a transaction initiated by the fixed line customer. The long distance call appears on the fixed line carrier's bill. That portion of the CMRS provider's revenue associated with a fixed line customer's call to a wireless customer appears bundled on the fixed line carrier's bill.

The calling party pays, and always has, for calls placed to a wireless subscriber. If a party calls another party, no matter who they are or where they are, the calling party pays for the call. The exclusive exception to this is for a roaming charge, which will be borne by the terminating customer, and if the terminating customer is roaming outside their home area, they will pay for the long distance portion of the charge as well.

It is important to point out another significant difference between Europe and the United States. Europe, and essentially all of the rest of the world, use a distinct telephone number for all wireless services. The significance of this is that the calling party knows that the number they are calling will cause their "meter to run faster". In most, if not all locations now, calling a wireless number does cost more for a fixed line customer, than calling another fixed line customer. Because of this conditioning in the marketplace, Calling Party Pays is ordinary and customary for European customers. They expect to pay discreetly for every call and they expect to pay at a rate that is appropriate for that call.

The Diagram found in Figure 2 describes a very simple business relationship between the customer and the fixed line operator that might exist in a European or Asian country – the International Model. The Figure is organized in exactly the same way as Figure 1. The call progress moves from left to right. The top half of the Figure represents relationships between the customer and the carriers and the bottom half of the Figure represents relationships among the carriers. In this situation, the customer receives one bill for the one transaction, and pays the one fixed line provider. The fixed line provider shares the revenue, through interconnection agreements, with the other two vendors involved in the transport of the call.

It is important to note that there is no Notice required because the calling party already knows that the called party is wireless, because of the discreet telephone number. The calling party already knows there may be an extra charge, because rates are published. There is no need for the calling party to know who the called party's CMRS provider is because there will not be a business relationship between them.

2.1.3 USA Business Model for Calling Party Pays: *Bill Direct*

Calling Party Pays for Wireless is now being considered in the United States. The Calling Party Pays *Bill Direct* Model (Figure 3) provides a potential description of the business relationship for CPP implementation in the US.

This Bill Direct version of the business model is believed to most closely represent the way CPP would appear if implemented as presently contemplated by the FCC in the CPP NPRM. The diagram flows in this chart are depicted in the same fashion as those in the previous two business models. That is, the call flow moves from left to right. Similarly, the calling party is a fixed line customer placing a call through a long distance company to a CMRS wireless customer who has elected optional Calling Party Pays. The top half of the Figure describes the business relationship between the customer and the carrier. The bottom half of the diagram describes the relationships among the carriers.

One immediately notices that on any specific call, the customer has a business relationship with three distinct business entities to complete this transaction. The customer has a relationship with their LEC for basic dial tone service. The customer also has a business relationship with their long distance carrier (IXC) for the long distance portion of the call. In addition, the customer has a new and casual relationship with the CMRS provider of the called party as well. In this situation the customer will be receiving a bill for the same transaction from two entities, the IXC and the CMRS provider.

The bill from the CMRS provider could well be for a single transaction, and the customer could be totally unaware of why they are receiving this bill. Even though Notice was provided at the time of the transaction, the customer receiving the bill may not have been the party who received the notice.

There is an equally difficult potential problem for the CMRS provider. It is very likely that the carrier will receive a call record for a customer for whom there is no information available other than their telephone number. Even if, and after, they have been able to get proper name and address, the company may well be sending a bill with one call, very likely valued less than the cost to the operator to prepare and mail the bill to the customer.

There is a further concern. The CMRS operator may not have a way to collect from the casual customer. There are other options that can be considered that can help to alleviate the problem of collections. There are national clearinghouse operations and service bureaus that can address the issue. However, there is a remaining question as to how a CMRS provider can implement the *Bill Direct* business model and serve the casual customer in a professional and business like way without causing confusion for the customer and potential loss of revenue for the company.

A closer examination of the *Bill Direct* Model points to additional issues surrounding this particular model. Figure 3A illustrates the extent of the customer impact with this type of business relationship. Under certain billing scenarios, the CMRS subscriber is faced with the receipt of three bills for one call. This would occur when a CMRS subscriber places a long distance call to another CMRS subscriber who has elected the CPP Option. The CMRS subscriber placing the call would subsequently receive one bill from his or her own carrier for the outgoing call, a second bill from the long distance carrier and a third bill from the CMRS provider of the called party.

As will be seen in later discussions in the Billing and Collections section of the Paper, this can become even more onerous when the terminating CPP carriers bill on their own behalf. In that case, each CMRS provider bills separately for calls made to their subscribers. If that happens, this will result in multiple CMRS bills being generated for one calling party. For example, under this scenario, if a calling party places a call to an AT&T CMRS subscriber, a Sprint PCS subscriber and an Omnipoint subscriber during the course of the month they will receive three separate bills. One from each of the CMRS providers whose subscribers they have called. This illustrates how truly onerous the *Bill Direct* Model can become for the customer and the carrier.

2.1.4 USA Business Model for Calling Party Pays: *Sent Paid*

There is another business model that might be considered in CPP implementation for the US. The Calling Party Pays *Sent Paid Model* (Figure 4) describes a potential alternative business relationship for CPP implementation and represents a modification of the International version of *Sent Paid*. While this is not presented as a prescription for a better way to do things, it is a different way of looking at relationships between customers and carriers and between and among carriers. If there is perceived to be value by reducing the number of bills produced by LEC's, IXC's and CMRS operators and payment transactions required by customers, than this Business Model may have some value as an approach in providing a viable option.

In the *Sent Paid* (US version) Model, the calling party still pays the full price of the call, including that portion of the call previously paid by the called party's CMRS customer. The example found in Figure 4 depicts the flows that occur when a fixed line customer places a long distance call to a CMRS subscriber. The significant difference is that the billing entity for the transaction is the carrier on whose system the call originates. In the case of the long distance call it would be the long distance carrier and for a local call the LEC. In this example, the relationship between the calling party and the LEC does not change. Similarly, the relationship between the calling party and IXC does not change with respect to the "long distance" portion of the transaction.

The IXC would now bill, as an adjunct to the itemization of the Long Distance portion of the call, another segment charge for the incremental terminating airtime. Since the two segments of the call can be listed together, it should be less confusing for the customer and considerably less costly for the billing entity than if a completely different bill needed to be produced. There is no need to create a "casual" customer/vendor relationship between the calling party and the CMRS provider of the called customer. Since the vendor relationship stays with the billing party, the Notice need not mention and identify the CMRS provider because it is of no concern to the caller.

This option clearly requires a great deal of cooperation between and among carriers. The Notice for the calling party is still required. The ability to identify, by distinct telephone number or AIN based Network Server that the calling number will result in an additional charge will still be required. In addition, it will still be necessary to notify the caller of the incremental cost of the call.

It should be noted, however, that the *Sent Paid* (US version) approach toward a solution has several potential benefits. It might make the transactions less confusing for the customer, make the billing of the transaction less costly for the operator, and increase the probability that the customer will pay the cost of the call to the billing entity. These are all relevant and major factors that will contribute to the success of the Calling Party Pays initiative.

2.2 Systems Infrastructure

Figure 13 represents a generic view of the telecom infrastructure commonly found in North America. Multiple vendors (operators) providing services for local service, long distance service and wireless service, characterize it. While not all operators are fully developed with an Advanced Intelligent Network (AIN) architecture, most have either the critical elements in their network, or have access to these elements through the network of a strategic partner.

The reason for the differentiation between the "Status Quo" diagram and the detailed diagram in Figure 15 is to show the increased complexity resulting from the notice requirements as proposed in the NPRM. While any of the individual components of the notice provide some incremental complexity in the network, the combination of requirements results in a significant limitation of implementation options.

The first issue is the identification that the called number is a CPP subscriber. As discussed elsewhere in this paper, an ERN assignment can solve that problem readily, with little impact on the network.

The second requirement is to provide notice that the called number is served by a particular network operator. This requires a logical linking of every CPP telephone number to an identification capability of an operator. If the business relationship for this casual call is to be between the caller and the operator serving the called CPP customer, this requirement is understandable. If, on the other hand, the LEC/IXC of the calling party will represent the called party, and act as the billing agent for the CMRS provider, including the provision of billing and collection services, than it will not be necessary for the Network to provide this notification.

Third, the network is to provide Notice as to the amount that the call will cost the calling party if the call is completed. Since that rate is set by the CMRS provider today, either that information must be communicated from the network of the CMRS provider through an Intelligent Peripheral, or a generic rating plan will need to be agreed upon among the CMRS providers and included in a common message. If this approach were considered, than the US implementation could follow the example used in several South American locations, where the message was eliminated after a "familiarization" period. Clearly, the degree of AIN architecture required to be employed to implement the CPP optional service will be directly related to the determination of how much, and how long, notice is required to be given to the calling party.

3.0 Principal NPRM Elements and their Network Implementation Implications

There are three principal elements of the CPP NPRM each of which present varying levels of implementation complexities for the network infrastructure of CMRS providers. The three elements are discussed under the categories of Optional CPP, Caller Notification and Billing and Collections. Taken alone, each element has its own implementation complexities. When taken in an integrated fashion, these complexities grow. For example, Optional CPP when combined with full caller notification requirements is more complex to implement than Non-Optional CPP with alternative caller notification requirements. The analysis of network implications that follows is undertaken both in terms of each individual CPP NPRM element, as well as the implications of combining multiple elements into a CPP solution.

3.1 Optional CPP

CPP has long been offered and is widely available as a Non-Optional service in many countries throughout Europe and Asia. It has also been offered on a limited basis as an optional service in the United States. As part of its ongoing CPP proceedings, the FCC has proposed that CPP be offered as a CMRS service option. In their Declaratory Ruling, the FCC states:

> Because we find that there is some uncertainty about the regulatory status of CPP, we issue a Declaratory Ruling clarifying that service offered with a CPP option, as defined above, still qualifies as CMRS service.[2]

The network implications of optional CPP and non-optional CPP vary significantly. In addition, CPP as an optional service can be offered in a number of ways, resulting in different implications for the network. This analysis and discussion explores network implementation of both non-optional and optional CPP.

3.1.1 Non-Optional CPP Implementation

In most countries where CPP has been implemented, it has been done as a non-optional service. Under the European model, Non-Optional CPP may be described as a service whereby all costs associated with placing a call to a wireless subscriber are borne by the calling party. The only exception to this rule occurs when a wireless subscriber roams outside of his or her home country. In that case, the incremental costs associated with delivering the call to another country are borne by the called party and all other charges are borne by the calling party.

There are several inherent differences in the way telephone service, both wireline and wireless, has been provided in Western Europe as compared with North America. These differences are significant to CPP implementation. While North Americans are familiar with "flat rate" services, that is, a customer pays one monthly rate regardless of the number and/or length of the transactions they initiate, Europeans are not. They are used to metered services; that is, they pay for each transaction and are charged for the duration of the transaction. Therefore, Europeans are already conditioned, as the calling party, to pay for a call to a wireless customer. It is not different than calling a wireline customer, except that the rate may be higher.

A second major difference is that wireless telephone numbers in Europe from the beginning carried a distinct prefix, so the calling party always knows they are calling a wireless customer. Notification to the calling party is not required because that party already knows there may be an extra charge for the call based on the information their service provider has already given the customer in the way of tariff and pricing detail.

There was no need, or market drivers to implement an Optional Calling Party Pays service offering in Europe. That was true for two reasons. First, differentiated telephone numbers made implementation of CPP less complex. Second and more importantly, customers were well used to paying for initiating all call transactions individually.

[2] Calling Party Pays Service Offering in the Commercial Mobile Radio Service, WT Docket No. 97-207, Declaratory Ruling and Notice of Proposed Rulemaking, (Released July 7, 1999), (Para 7), (*Declaratory Ruling and Notice of Proposed Rulemaking* or *NPRM*)

3.1.2 Optional CPP Implementation

Optional CPP has not been as widely implemented as its non-optional counterpart. As a matter of fact, Optional Calling Party Pays is particularly an invention of the Latin and South American market and is, more recently, the preferred choice for implementation in the US market.

In June 1997 The CTIA published a "White Paper" titled, The Who, What and Why of "Calling Party Pays". To this date, this is the most comprehensive document available which discusses the various experiments in Calling Party Pays by several telephone companies. Basically, the document separates these activities between LECs and unaffiliated cellular companies. They further separate their analysis between implementations, which utilize an AIN architecture, and that which utilizes the "traditional" network.

More recently, there has been some published information concerning a plan that AT&T has introduced in some of its locations for a Calling Party Pays application, as well.

It is important to note that Optional CPP can take on different meanings when discussed in terms of implementation methodologies. This is best exemplified by the way, in which some of the Latin American countries have implemented Optional CPP as compared to that implementation envisioned for the US. For example, according to a study conducted by The Strategis Group [3], CPP was implemented more as a "default" than an option. In Argentina, Chile and Mexico, all wireless subscribers were automatically converted to CPP and were required to later "opt out" if they chose to remain a wireless party pays subscriber. It was essentially a default method of implementation.

In the US, CPP implementation is expected to be quite different. Here, subscribers are likely to have to make a decision as to whether they want to remain a Wireless Party Pays subscriber or become a Calling Party Pays subscriber. The election might be similar to the choice one makes when selecting a long distance carrier. It is not an automatic selection made by a carrier, bur rather it is a proactive choice on the part of the customer to change from WPP to CPP.

The impact of a "default" versus "option election" method of implementation can be seen on several fronts. First, is the impact it has on the CPP "take-rate". If CPP is automatically provided to all, it is more likely to get a much higher acceptance because fewer subscribers are likely to "opt out". This might explain the almost total acceptance of CPP (ranging from 90% - 100% take rate in the countries studied) [4] in Latin America despite the fact that it is an optional service. It is unlikely that the US will experience the same CPP acceptance and take rates with an "option election" method of implementation.

A second impact with this type of implementation might be seen in the up-front work required by the CMRS provider to implement the service. To the extent that all subscribers are automatically switched to CPP, there is no need to determine prior to cutover, which embedded base customers would like to have the CPP option. Under the "option election" approach, CMRS providers are going to need to notify their customers of the CPP option. This is likely to generate large call volume into customer service. The effort and resources that are required under this approach are significantly greater than with the default approach. The additional resource

[3] *"Calling Party Pays: International Case Studies"*, prepared for the PCIA by The Strategis Group.
[4] Ibid.

requirements and work effort associated with the "option election" method is likely to make the implementation more complex and costly for the CMRS providers than was experienced in the Latin American Optional CPP implementation.

Regardless of the implementation methodology, for all of the optional CPP services described here, in keeping with industry practices in the US and abroad, the service is discussed in terms of a CMRS subscriber being located in their home area.[5] When a CMRS subscriber who has selected the CPP option is roaming, it is assumed that they will continue to bear the incremental cost of delivering that call to them outside their home area. These incremental costs might include long distance charges, as well as any surcharges (i.e. higher per minute airtime charges often apply) associated with roaming. The calling party will be responsible for all other charges.

There have been several types of Optional CPP tried and/or proposed in the United States. This paper will identify and explore some of the more widely discussed CPP implementation options. Optional CPP will be evaluated to determine the implementation implications for the network infrastructure of the CMRS provider.

3.1.2.1 Static Optional CPP

Static Optional CPP describes a potential service offering whereby a CMRS subscriber may elect a CPP option on a one-time basis. This optional offering may have a dependency on the assigned telephone number, which would make later changes to this election service impacting for the CMRS subscriber.

CPP election decisions by the CMRS subscriber will determine which party ultimately assumes billing responsibility for incoming calls. In the case where the CMRS subscriber chooses Static Optional CPP, the calling party will pay for all incoming calls made to the CMRS subscriber when they are located within their home area. CMRS subscribers selecting this option will no longer pay the incremental airtime charges associated with incoming calls, these charges will now be borne by the calling party. In instances where the CMRS subscriber does not choose the Static Optional CPP, charging will continue as it is today. Incremental airtime charges for incoming calls will continue to be borne by the CMRS subscriber and all other charges associated with the call will be the responsibility of the calling party.

3.1.2.2 Dynamic Selection Optional CPP

Optional CPP election need not be a static process. Another way of optional implementation is to offer it as a "changeable" selection. Under this type of option, customers would be able to choose, structure and change the option to better meet their own needs. For purposes of this discussion, the changeable options will be categorized as Dynamic Selection Optional CPP. The two types of Dynamic Selection Optional CPP evaluated in this paper are defined as User Selectable and Preferred Calling Party List Optional CPP. Each offers varying degrees of flexibility and resulting implementation complexities for the network infrastructure.

[5] This would be analogous to the situation in the US., when a customer call forwards their line to another telephone number, the calling party is only responsible for the charges normally associated with calling that number. The called party is responsible for additional charges associated with the forwarded leg of the call. Similarly, in the European version of calling party pays, wireless subscribers are responsible for the incremental costs associated with delivering that call to another country.

3.1.2.2 User Selectable Dynamic Selection Optional CPP

User Selectable Dynamic Selection Optional CPP describes a potential service offering whereby a CMRS subscriber may choose CPP as an option and easily change that election over time. They will be able to easily activate and deactivate the option with little or no impact on their service. Unlike its static counterpart, this option would not contemplate a telephone number change for each time the CPP option is activated and deactivated.

CPP election decisions by the CMRS subscriber will determine which party ultimately assumes billing responsibility for incoming calls. As with the Static CPP Option, if the CMRS subscriber activates the User Selectable Dynamic Optional CPP, the calling party will pay for all incoming calls made to the CMRS subscriber when they are located within their home area. CMRS subscribers activating this option will no longer pay the incremental airtime charges associated with incoming calls, these charges will now be borne by the calling party. Conversely, in cases where the CMRS subscriber does not choose to activate the User Selectable Optional CPP, charging will continue as it is today. Incremental airtime charges for incoming calls will continue to be borne by the CMRS subscriber and all other charges associated with the call will be the responsibility of the calling party.

3.1.2.2 Preferred Calling List Optional CPP

A second, more flexible type of dynamic CPP option might be described as a Preferred Calling Party List Optional CPP. Preferred Calling Party list Optional CPP describes a potential service offering whereby a CMRS subscriber may be able to not only determine whether or not they want the option, but also for whom they want the option to apply. Activation and deactivation of this Option, as well as changes to the Preferred Calling Party list are meant to be dynamic in nature and non-impacting to the service of the CMRS user.

Under the Preferred Calling Party List Optional CPP, the CMRS subscriber determines a select list of incoming callers for whom they do not want CPP to apply. When an incoming call is received from a calling party whose number appears on the list of the CMRS subscriber they are calling, the charging responsibilities will remain as they are today with the CMRS subscriber continuing to pay for the incremental airtime charges for these calls. Similarly, in cases where the CMRS subscriber does not choose to activate the Preferred Calling List Optional CPP, charging will continue as it is today. For all calls placed to a CMRS subscriber who has chosen the CPP option; and, for calls from calling parties whose numbers do not appear on the preferred calling party list of the CMRS subscriber they are calling, all incremental airtime charges will be paid for by the calling party.

3.2 Caller Notification

Unlike elsewhere in the world, wireless telecommunications in the United States has developed as a "called party pays" market. Wireless subscribers and their called parties have long been used to a system whereby the called party bears the cost of airtime charges for the incoming calls and the calling party pays the balance of the call charges (i.e. local, toll or long distance charges). The implementation of a CPP option would change this paradigm and result in the calling party paying incremental airtime charges when calling a CMRS subscriber. In order to

alert the calling parties of this change the FCC, in its CPP proceedings, explored caller notification requirements.

This paper undertakes an exploration of the FCC Caller Notification requirements, as well as alternative approaches to the process. It also provides an analysis of the network implications associated with each approach.

3.2.1 FCC Requirements

In the CPP NPRM, the FCC established proposed requirements for a uniform notification announcement to be provided by the CMRS provider to the calling party and they state:

> "Because CPP will represent a significant change to consumers calling a wireless telephone or pager, we believe that initially it is important that notification include the following elements:
> (1) Notice that the calling party is making a call to a wireless phone subscriber that has chosen the CPP option, and that the calling party therefore will be responsible for payment of airtime charges.
> (2) Identification of the CMRS provider.
> (3) The per minute rate, and other charges, that the calling party will be charged by the CMRS provider.
> (4) Notice that the calling party will have an opportunity to terminate the call prior to incurring any charges."[6]

Under this notification process, the FCC contemplates verbal communication of the four elements listed above each time a calling party reaches a CMRS subscriber who has elected a CPP option.

3.2.2 Alert Alternative

There are a couple of potential caller notification alternatives to the full FCC requirements, described here as Alert Alternatives. These alternatives address many of the same elements proposed by the FCC, but differ in terms of scope and delivery methodology.

Description

Under the first Alert Alternative to calling party notification, many of the proposed FCC elements are provided. The calling party is notified that they are calling a CMRS customer and that an incremental charge will apply. In addition, they will also be informed that they have the ability to terminate the call before charges apply. The identification of the CMRS provider and actual per-call charges are not provided under this alternative.

The methodology for delivery of caller notification also varies under the proposed Alert Alternative. Under this alternative, the calling party hears a tone when they place a call to a CMRS subscriber who has elected a CPP option. The calling party will have a period of time to hang-up before the call is completed if they want to avoid paying the charges. All other

[6] *NPRM*, (para. 43).

notification elements will appear in the preamble of the local telephone book and/or the instruction manual of the service provider.

With the alert alternative, the following notification elements will appear in the book or manual:

1. Notice that a specific "distinctive" tone will mean that the caller is calling a CMRS subscriber who has elected the CPP option.
2. Explanation that incremental charges will apply for call where the tone is heard.
3. Notification that the caller has the ability to hang-up before the calling party answers to avoid these charges.

A second Alert Alternative is described here as the "Not-to-Exceed Pricing" Alert Alternative. Under this approach, a carrier voluntarily establishes a maximum price for their service that applies to the calling party when they place a call to one of their CMRS subscribers who has elected a CPP option. Provided the CMRS provider continues to price that service at or below the "Not-to-Exceed Pricing" maximum, a statement of charges would not be needed in the caller notification process. However, should the CMRS provider exceed that maximum, a statement of charges would be needed as part of the caller notification requirement.

In cases where the CMRS provider does not exceed the "Not-to-Exceed Pricing" maximum, the Caller Notification requirements would be as follows:

- The caller will hear a recording identifying the CMRS operator
- The caller will have the ability to disconnect after hearing the tone if they wish to avoid the charges.

Notification of the maximum "Not-to-Exceed Pricing" will be through publication in the CMRS service manual and/or in the local telephone book. As an alternative, this notification might also be made as part of an initial advertising campaign.

In cases where the CMRS operator charges above the "Not-to-Exceed Pricing" maximum, additional per call notification would be required. The additional requirement would be in the form of a statement of the rates to the calling party at the time that they place the call.

3.2.3 Implications for Network Implementation

While the method of implementing a CPP service will definitely influence the requirements of the network, this White Paper focuses on those changes which "must be" done, rather than those items that "might" be done to accomplish the requirements.

The degree of complexity of required network changes does not only directly affect the cost for a service provider. It will also determine which service providers may offer enhanced CPP services directly, and those who cannot because their networks simply cannot accommodate the technical requirements and the cost to upgrade their networks exceed their ability to pay. In those cases, the only way they can participate in providing competitive services to their customers is to "rent" functionality from larger operators at higher costs, making them less competitive. This situation may be particularly problematic for rural areas of the country where it is more likely for smaller operators with minimum infrastructure to serve the area. As a result, customers in rural areas may have less access to high technology services or are forced to pay higher rates to receive the services.

Of the services discussed above, Static Optional is the easiest to implement. However, regardless of the method of implementation, the NPRM caller notification requirements will have significant implications for the network. The following discussion addresses possible ways to implement notification solutions and their impact on the network.

1. The Calling Party must be notified that the number being called belongs to a CMRS subscriber who has elected CPP.

   By far, the easiest way this can be implemented is to assign one or more NPA codes for CPP subscribers. If this were done, it may be possible to implement the service without the use of an AIN platform. If separate numbers are not possible, than a database similar to that designed for the implementation of number portability would need to be considered. Once this kind of a solution is required an AIN network architecture is prescribed.

2. The customer must be notified of the charge that will be applied if the call is completed.

   Once again, the degree of complexity of the solution is directly related to the degree of complexity of the implementation approach. If the telephone numbers of CPP customers are previously known, than the pricing for calls to those numbers can also be published in advance. Rates for those calls can also be described in terms of "not to exceed" prices so that specific quotes for specific numbers called could be avoided. If a "real time" database query is required to identify whether the customer is CPP than the pricing notification is more complex, although a "not to exceed" price notification strategy could still be considered.

3. The calling party must be given the opportunity to avoid the possible charge associated with a completed call to the CPP customer.

   The simplest way to meet this notification requirement is to recognize the called number is CPP by a distinctive number, refer to the published rates for calling a CPP number, and decide not to place the call. Other solutions that involve monitoring and controlling the call setup operation and interrupting the process to prevent call completion will involve some aspect of AIN.

4. The customer must be notified of the identity of the CMRS provider.

   Identification of the CMRS provider presents a unique challenge for the operator. Regardless of the implementation approach used, this portion of the notification process will be particularly difficult to implement.

The most costly part of the implementation of the proposed operational procedures for calling party pays is the ability of the network to identify that the number dialed by the calling party belongs to a CPP customer, and to provide the subsequent notice that has been specified. If the number cannot be distinctive, as discussed above, that there must be a "look up" in a centralized database that is managed to be used by all operators who can access the network. The degree of complexity of that task is similar to that of the Local Number Portability (LNP) database, except that one can expect the amount of "churn" in the CPP database to be significantly greater. This is particularly true in the early stages of the service offering, or if additional features, such as preferential number lookup (Preferred Caller List Optional CPP) is included.

Identification of the CPP customer is more difficult without the use of an Easily Recognizable Number (ERN). The network will be required to have a separate database of CPP numbers, accessible by all CMRS service providers for provisioning and data management purposes, and accessible by all call transactions during call set-up.

Once it has been identified as a call to a CPP customer, notification must be provided. In order to supply the required notice, there must be linkage between the call*ed* number, and the CMRS service provider's rate structure for that CPP user. There must than be some type of pre-recorded message, or voice synthesis of the rates to the calling party. Finally, there must be the ability to not complete the call until some calling-party trigger event occurs. Notice can be simplified through the use of "Not-to-Exceed Pricing" as previously discussed.

Fundamentally, there are three approaches, each with slightly different implementation possibilities, for the provision of notice to the calling customer. Although each has advantages and disadvantages, these three approaches describe the possible ways the Notice requirement can be satisfied.

Approach 1

Under the first approach, the Wireless CPP customers and their CMRS providers are distinguished through an Easily Recognizable Number (ERN). The first three digits would identify the subscriber as a CPP customer (i.e. 500 service area code) and the next three digits of the number (i.e. 500-456) would identify the specific CMRS provider.

Given an adequate advertising and public relations program by the industry and the CMRS operator, in this situation, it can be assumed that the caller has received adequate notice that the CMRS subscriber is a CPP customer and the caller will be billed for the call. Further it will be possible for the rates of the CMRS providers to be published in a reference document readily available to the calling party. There will be no necessity for the calling party to have the ability to cancel out of the call before it is completed because the customer will be aware of the charge for the call before it is initiated.

The CMRS service provider will generate a CDR at the terminating MSC with the additional charges for the calling party and pass the rated record to the enterprise with the bill generation responsibility. The exact nature of the tax implications is not clear at this time and warrants further investigation.

Implications for Network Implementation

This approach would require some network changes. First, would be the need for the implementation of a separate ERN database available for CPP. In addition, the MSC would be required to prepare a CDR, and a rating algorithm to rate the call. There may be an additional requirement to reformat the CDR record into an agreed-upon EMR format readable by external billing systems.

Approach 2

Under the second approach, the CMRS provider of the called party provides all elements of the Caller Notification requirements, as called for in the CPP NPRM, to the calling party.

In all cases, the calling customer's dialed digits are passed through to the CMRS provider's network where they are matched with the operator's database of CPP numbers. This could be in the HLR/VLR or a network based database provided by the operator for that purpose. If the incoming digits matched the CPP database the rating tables for the operator would be referenced. Once a "match" has been accomplished, using the number of the calling party and the called party service profile located in the HLR/VLR of the CMRS operator, a rate for the call could be calculated. A network based voice announcement system could than be accessed to provide the information to the calling party. At that point the calling party would be given the opportunity to terminate the call setup by hanging up the telephone within a specified time of the completion of the announcement. Should the calling party allow the call to continue, the CMRS operator would generate a CDR in the same way as the previous example.

Implications for Network Implementation

In this approach, the full weight of the network impact would fall to the CMRS operator. Most of that impact would be in a redesign of the HLR/VLR, as well as the creation of a searchable CPP number database addressable by SS7 network. There may be changes to the central office equipment to create the appropriate CDR record to comply with the billing requirements. In addition, equipment and software necessary to provide for the announcement capability would be required.

Approach 3

Under the third approach, Common Network Elements provide telephone number recognition, CMRS operator identification and rating notice for the calling party.

While it may be more cost effective to develop a network consolidated database of CPP telephone numbers for all CMRS providers, and there may be some economies of scale resulting from such consolidation, it comes at a significant cost. The effort to agree upon, set up and administer such a database may well cost more than the resulting cost savings. Similarly, it would be possible to establish a national database that could equate the telephone number of a CPP customer to the appropriate CMRS provider. Once again, one must consider the administrative costs compared to the corresponding value. The bottom line is that the establishment of common shared resources is an alternative but the costs in coordinating efforts, and the required administration may offset the savings that could be realized.

Implications for Network Implementation

All of the common network solutions will require an IN network solution, agreed upon by the stakeholders, developed by all suppliers to common specifications and administered by a common agency satisfactory to all players. Success with this kind of a solution would be difficult.

Naturally, the technically simple solutions all carry penalties in terms of potential customer dissatisfaction and/or related network considerations. The easily recognizable number

creates a problem related to the shortage of usable telephone numbers available to carriers today. This would also require customers to change telephone numbers if they change from CPP to WPP (Wireless Party Pays) options. This is unsatisfactory as well. As soon as the solution requires a supplementary database of CPP numbers, the requirement for AIN is realized, and the other issues of quoting prices to callers and interrupting call processing for notification cannot be avoided.

In those countries in Latin and South America where optional CPP has been implemented, notification was only required for an initial period of time. Customers are, however, used to metered measurement for all their calls, as opposed to flat monthly rates.

Once the decision has been made to involve the network to the point where an AIN architecture is mandatory, a carrier is free to add many other features that may offer opportunities for value added services. These services, which might be achieved through only an incremental investment, include: the storage of preferential numbers, who shall not be charged for CPP, frequently called numbers, or other kinds of services for the called or calling number. It would require the availability of SS7, a real time database, and applications software.

3.3 Impact of Billing and Collections on CPP Implementation

An integral part of the national CPP service option being considered by the FCC in its CPP NPRM is the need for a comprehensive billing and collections mechanism. Parties commenting in the CPP proceeding have offered several alternatives, but to date no in-depth analysis has been conducted. A review of the comments and related CPP issues seem to point to three principal options for performing some or all of the billing and collections functions. These options include:

- Each called CMRS provider (terminating point carrier) billing on its own behalf
- A Third Party Provider billing on behalf of all of the CMRSs
- The originating subscription carrier (i.e. LEC, IXC or CMRS) billing on behalf of the CMRS provider

The White Paper considers each of these options and explores the billing and collections issues in several areas. It first provides an overview of the principal billing, collections and customer care processes. This builds a framework for understanding the implications of CPP implementation. Those implications are then discussed in the context of the two business models – *Bill Direct and Sent Paid* (USA version).

3.3.1 The Billing, Collections and Customer Care Processes

In order to determine which party is best suited to provide CPP Billing and Collections, one must first understand the various components involved in the process and how they fit together. The Billing, Collections, and Customer Care processes are all designed to be tightly coupled, if not totally integrated with each other. The functions involved in these processes are complex and need to flow smoothly for both customer satisfaction and carrier financial security.

The process flow for Billing and Collections functions is outlined in Figure 7. It provides a framework for identifying those functions that will be impacted by the introduction of Calling Party Pays under the Bill Direct business model.

It is important to note that each of the main functions of "Billing, Collections and Customer Care" is comprised of a number of distinct sub-functions that must be accomplished in order for a bill to be rendered to a customer. Consideration must be comprehensively given to all of the component parts. Each of the elements of the Billing and Collections Processes found in Figure 7 are discussed in greater detail below.

3.3.1.1 Creation of Call Detail Record (CDR)

The creation of a call detail record is triggered by a call being made. Call Detail Records are created along the path of any call. There are normally one or more records that are created by the Network Switching Elements along the path of a call, which *could or will* be used for billing purposes. These records will indicate, among other things, the call*ing* and call*ed* parties' telephone numbers, "bill to" numbers and pertinent information about the call itself including start and end times (or call duration) and any special features used during the call. This marks the start of the end-to-end billing process.

3.3.1.2 Collection and Formatting of CDRs

A potentially *billable CDR* is created after the call is successfully terminated (answered). These records may be collected by the System Operator in near real-time or in batches throughout the day. Raw CDRs are collected from different vendors' switching systems and are always formatted into a common format for ease of downstream processing.

Secure data collection is important here, as well as at every point within the process. In order to assure the company's revenues, data is collected along the *billing path* and reported to the system operator to insure that there is no loss of revenue-records. To the extent that a party other than the CMRS provider is involved in the billing process, revenue assurance becomes more complex as data must now be collected across multiple company's systems.

3.3.1.3 Rating Process

Rating is the process that applies a *charge* to the call detail record. Call detail rating is normally a simple process (but can be complex if certain discounting needs to be applied at the call detail level). On the other hand, factors such as high volumes of records and the manner in which the operator decides to display call detail records on a customer's bill can require a significant amount of processing.

The process described in Figure 7 is for post billing as opposed to prepay billing. An important distinction is made for certain prepay implementations (since not all are done the same way) and debit operations. In these instances, near real time rating is required to make the service work.

In order for rating to take place a number of other inputs are required in addition to the CDR record. These include a customer's price plan from the CMRS Rate Plan Table (defines the deal), landline rating tables, free call tables etc. The output of the rating process is *one* of several inputs to billing process.

3.3.1.4 Billing and Invoice Creation

Billing can be simple or complex depending upon the operator's approach and market drivers. Billing generally takes place as a monthly batch process (not real-time) but can be done at either longer intervals or in near real-time if the customer's plan requires it.

It is important to note that, billing is usually done by the calling party's subscription carrier for the given call (LEC, IXC or CMRS). There are exceptions to this paradigm such as collect calling, 3rd party billing, and 800 Billing Service. In addition, in the US, calls to wireless phones are divided into two parts and both calling and called parties pay for individual portions of the call. Typically the incoming airtime is charged to, and paid for, by the call*ed* party. In these cases the CMRS provider collects incoming CDR's for the purposes of billing its subscribers for the incoming call. Calling Party Pays changes this paradigm and will result in the calling party being billed for calls to wireless customers who have selected CPP as an Option.

In any event the process of billing, in a post pay scenario, involves a number of steps including:

- Application of a fixed monthly charge
- Application of prorates for a partial billing period
- Application of other charges not necessarily related to calls
- Application of Taxes
- Application of Payments
- Application of Adjustments
- Application of Volume Discounts

Invoice creation involves the electronic creation of all of the components that will be displayed on the invoice. It may or may not include formatting at this stage but it will contain all of the critical content for the final bill.

The output of the billing process is both the invoice creation and the creation of an Accounts Receivable (A/R) for the customer. In addition there are a number of reports generated to assure financial soundness of the process.

3.3.1.5 Bill Fulfillment – Printing and Mailing

The term Bill Fulfillment normally applies to the two main functions of Printing and Mailing. However, it often includes the formatting of the invoice to have it look a certain way.

The output of this process is a postmarked envelope containing both the customer invoice and return payment slip and envelope. Generally, these invoices are mailed to a carrier's subscription customers. These invoices may contain billing information for other carriers' services as well. In the Calling Party Pays *Bill Direct* model, these invoices must be sent to non-subscription customers.

3.3.1.6 Lock Box Process

The Lockbox process is triggered when a subscriber sends his or her payment to the financial institution selected by the CMRS provider.

The Lockbox process includes the posting of payments to the carriers' account and the creation of an electronic feed to the carriers' payments system. This feed contains payment information at the subscriber level and will be used by the carriers' payment system to process the appropriate financial transactions. This includes such transactions as relieving the *subscribers'* Accounts Receivable and posting cash payments to the business.

3.3.1.7 Payment Processing

Payment Processing is normally one of the integrated components of a carrier's billing system. The primary input to the payment system comes from the lockbox process. In fact some carriers require all of the payment processing to be done this way for control purposes. Payments made at a POS (Point of Sale), for example, are still sent to the lockbox and posted in the normal manner.

3.3.1.8 Accounts Receivable

An Account Receivable is created at billing for each subscriber and is generally relieved via payment processing. However, an account receivable may also be relieved via an adjustment to a customers account. This can be done systematically or by the actions of a customer service or collections representative. In the Calling Party Pays Bill Direct Model, the account receivable may need to be established for the non-subscriber.

3.3.1.9 Customer Care

Subscribers with questions concerning their bills usually call a Customer Service call center where representatives assist them. In fact, this represents a significant portion of the calls in to the Center. It has been estimated that over one-half of the queries to a CMRS call center relate to billing issues. This could have significant operational ramifications for the CMRS provider under the bill direct model if they chose to do their own customer care for the non-subscription customers.

When the output of the query results in an *adjustment* to a subscriber's bill, intervention by a customer care representative is required. This can often be done automatically at the time of the query. Today's Billing and Care Systems often permit the customer representative to provide credit on unbilled or even unrated calls.

3.3.1.10 Arrears Management

When customers fail to pay their bills on time (or don't pay at all), an arrears process is triggered. This arrears process will consist of the following components, which is dependent upon the nature of the subscriber, the amount of dollars involved and the lateness of the payment:

- Soft Notices
- Hard Notices
- Suspension of service
- Disconnection of service
- Submission to a collections agency
- Write Off

3.3.2 Responsibility for Billing and Collections Functions

The Calling Party Pays paradigm has a *profound* impact on these business processes in terms of who does them and how they are performed. In addition, CPP may require additional process components. The effect of CPP is to shift all (or part) of the responsibility for payment of the airtime portion of the call onto the calling party. This requires the *calling party to pay* for the entire *end-to-end* call as the calling party does for most other calls.

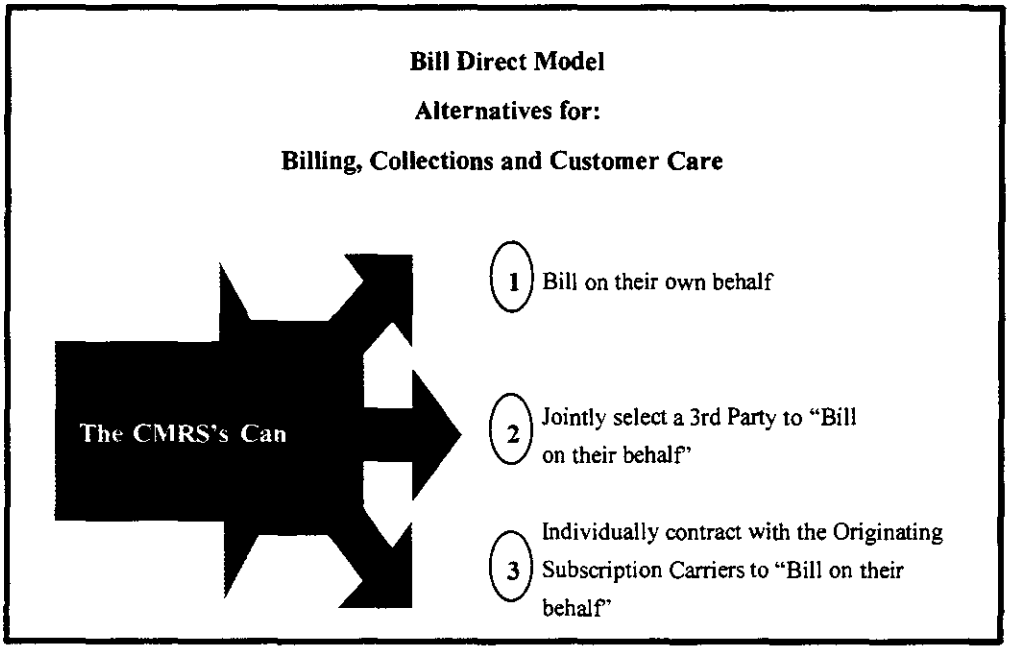
In Figure 8, "Responsibility for Functions", we see that the responsibility in the US *Bill Direct* model is very different from the International *Sent Paid* model. In fact, the only thing in common between the two methodologies is that the calling party pays.

3.3.3 Billing, Collections and Customer Care under the Bill Direct Model

The *Bill Direct* Model assumes that the called party's CMRS provider will have ownership for the CPP call. Billing ownership, in this case, means that the CMRS provider essentially "owns the collectible". The calling party becomes a temporary customer of the called party's CMRS provider. This is an important distinction. The mere fact that the calling party becomes a customer of the CMRS provider creates a scenario whereby a casual caller must be treated like a subscription customer for purposes of the CPP call. This creates a complex billing arrangement that is discussed in greater detail throughout this section.

While the CMRS provider has billing ownership, it does not necessarily mean that they have to perform all of the billing, collections and customer care functions on their own. In fact, there are several alternatives that are available to the CMRS under the *Bill Direct* Model. Diagram 2 illustrates these alternatives.

Diagram 2: Bill Direct Model – Billing Alternatives



The billing, collection and customer care alternatives outlined above provide a conceptual framework of the most viable options. It is built on the premise that the billing process is made up of components that could be done by a number of different parties.

The first alternative assumes that the CMRS provider of the Called Party provides, on its own behalf, all functions of the billing process, from initial call processing through billing, customer care and collections. Alternative 2 assumes that all CMRS providers contract with the same Third Party to perform specified billing functions. In the final alternative, each CMRS provider would enter into a billing and collections contract with the originating subscription carrier(s) to have them perform specified billing functions. It is important to keep in mind that alternatives 2 and 3 assume that other parties are billing on behalf of the CMRS provider, it does not shift the ultimate billing ownership.

3.3.3.1 CMRS Service Provider of the Called Party bills on their own behalf

Figure 9 considers the impact of a Bill Direct CPP implementation on the business processes of the CMRS provider. It explores an alternative that involves the CMRS provider taking on the responsibility for the end-to-end process. This does not mean that the CMRS provider cannot outsource any functions, but it does assume that the CMRS provider takes on the responsibility without relying on any other LEC, IXC or CMRS agreements. In this scenario, the CMRS provider bills on its own behalf.

Since the CMRS provider will now be billing the calling party, additional functions need to be added to enable the billing of non-subscription customers. The Originating Subscription Carriers must provide name and address information to the CMRS provider's so that post-call *Billing* can take place. It would make sense for some type of clearinghouse to perform this function so that timely transfers of Billing name and address information can be retrieved in a secure fashion by the terminating CMRS providers.

Once the CMRS providers have this information they can run the billing function and send the electronic invoice to their bill fulfillment center. The bills are then sent out to the calling parties in what essentially becomes the CMRS provider's envelope.

Assuming there are no disputes, the billed party will send the payment to the lockbox and the collections process can be completed. Customers with queries will be directed to a toll free number, where they can speak to a CMRS provider representative. This representative will respond to these queries and make adjustments if necessary.

There are several issues that arise with this process including scale, risk, multiple bills, establishment of accounts receivable records, failure to get name and address information, and customer care. The Calling Party Pays Bill Direct model raises issues in each of these areas.

Scale

There is an obvious *loss of scale* on the bill fulfillment functions. Under the Calling Party Pays Bill Direct Model, the invoice amounts are likely to be small while the volume of bills is likely to be significant. While today's Wireless Party Pays subscriber may not widely distribute their telephone number, CPP is expected to change that paradigm. In fact, CMRS providers are looking for CPP to significantly increase incoming call volumes.

Figure 5 highlights the fundamental, and well-recognized, aspect of Billing Services scale. It is not unusual for the cost of a Bill to run around $1.50-$3.50 if you include all of the functions from CDR collection through Bill Fulfillment. No telephone company or service bureau was willing to provide an estimate of costs for billing for CPP. In every case when the question was asked, the company felt that the information was confidential and was unwilling to provide more information.

There are two issues here for the CMRS provider. First, with the advent of CPP, the calls that used to be billed to a subscription customer of the CMRS provider are now going to be broken up and billed separately to a large number of calling parties. This will result in a larger number of monthly bills for the same call volume.

The second issue that arises pertains to the nature of the new bills that are generated for CPP. Bills generated for the calling party will be significantly larger in volume and contain far fewer calls per bill. This creates an obvious inefficiency for the CMRS provider who, prior to CPP implementation, would have sent out a smaller number of bills with a larger number of calls on each.

Sending a bill out with few calls and small amount due could very well become cost prohibitive. One could influence this somewhat by sending out quarterly bills, but there may be other factors to consider there as well.

Risk

When billing non-subscription customers, there will be a much higher risk of Bad Debt. The CMRS operator has little influence over the casual caller. The economics may not even be there for the CMRS operator to go after the non-payer. Even sending a reminder notice may cost more than the amount of the invoice.

Multiple Bills for the Calling Party

The potential need for sending multiple bills is perhaps the *most significant customer impact* of this scenario (CMRS provider billing on its own behalf). The impact this has on CMRS's *collective* casual customer can be staggering. For example, if one caller places calls to friends or colleagues who have service with 4 different CMRS providers, they could receive up to 6 telecommunications bills in one month (one form their LEC, one from their IXC, and 4 from CMRS providers). Given today's telecommunications marketplace, this would not be an unusual example.

The Accounts Receivable Record

Today, the CMRS provider's Accounts Receivable System is based upon subscription customers, not casual customers. A system for tracking the casual customer's A/R and bill payments would need to be established. This could be done, for a price and would need to be updated for address changes periodically.

Name and Address Information

If the CMRS terminating carrier is unable to persuade an Originating Subscription Carrier to provide name and address information, then calling parties originating calls on these networks would need to be challenged for a credit card or blocked. As of today, ILECs must provide this as a matter of ruling, but CLECs and CMRSs do not. This could be a disincentive to call CPP subscribers.

Customer Care

Today's CMRS subscription customers call the Call Center in record numbers. It would not be inappropriate to assume that Call Center volumes would increase due to confusion on the part of calling parties (which would diminish with time and education) as well as requests for credit for dropped calls or other problems.

The increased Call Center call volume could have a significant impact on the CMRS provider. Total Customer Care costs can run between $5-$7 per subscription customer per month, even at fairly high levels of scale. It is unclear what the costs would be for casual subscribers. What we do know is that the ARPU from them would be significantly lower than today's subscriber base.

3.3.3.2 A Third Party performs billing functions on behalf of all CMRS Providers

As an alternative to the CMRS provider performing these functions themselves, there is the possibility of CMRS providers jointly selecting a 3rd Party Solution provider who would perform some, or all, of the billing, collections and customer care functions on their behalf. Figure 10 illustrates the process if a 3rd party was jointly employed to perform tasks on behalf of all of the CMRS providers.

In this 3rd Party scenario, the CMRS providers could still collect and format the requisite incoming CDR records and forward them to the service provider. The 3rd Party Billing Service Provider would then perform the billing, collection, and customer care functions on behalf of all of the CMRS providers. There are other ways to divide the functions but this scenario seeks to minimize handoffs between the CPP billing service provider and the CMRS provider.

There are several issues that arise under this scenario including the costs of the 3rd party service provider, scale, risk, the need for multiple bills for the calling party, and inability to obtain name and address information. Under the Calling Party Pays Bill Direct Model, The 3rd Party Billing alternative raises issues in each of these areas.

Cost of the 3rd Party Billing Service Providers Service

The 3rd Party Billing Service Provider will have underlying costs and a profit margin to make. The CMRS providers must consider this factor. It would seem unlikely that the costs per bill would be lower than today's cost ($2-$4/ bill) nor would it be likely that customer care costs would be lower than today's ($5-$7/ subscriber/month).

Scale

Scale is improved over the first alternative because the Service Provider can put multiple CMRS providers' charges on one bill (appropriately identifying each of the carriers and their respective charges). This should enable the 3rd Party Billing Service Provider to pass along the scale savings and achieve numbers closer to the ones sited above.

To the extent that several CPP Billing Service Providers are selected rather than a single one then scale will be impacted negatively.

Risk

Risk may be reduced as the 3rd Party Billing Service Provider can assist in collections, but it will still be higher risk (than today) since the penalties are minimal and the payment due may not be worth the collections costs in most cases.

Multiple Bills for the Calling Party

The 3rd Party Billing alternative is not as onerous as individual billing by CMRS providers in terms of the number of bills that are generated for the calling party. Nevertheless, the calling party can expect an additional telecommunications bill every month if he or she calls any CMRS CPP subscriber, provided only one 3rd Party Billing Service Provider is used by all CMRS providers. To the extent that several CPP Billing Service Providers are used, then the calling customer can expect additional bills each month.

Name and Address Information

If the CMRS terminating carrier is unable to persuade an Originating Subscription Carrier to provide name and address information, then calling parties originating calls on these networks would need to be challenged for a credit card or blocked. As of today, ILECs must provide this information, but CLECs, IXCs and CMRS providers do not. This could be a disincentive to call CPP subscribers.

3.3.3.2.1 Examples of Third Party Billing and Collections Service Providers

Third Party Billing and Collections options were explored to determine viability, implementation timelines and cost of this as an alternative. In addition, the manufacturing community was explored to determine its role in developing infrastructure for CMRS providers to enable them to offer CPP.

There are several CPP Solution Packages that are being developed to offer function, features and services in support of Calling Party Pays. Some of these solutions offer network options that can work both with and without AIN 0.1 triggers.

The packages cover a range of services that may include the following:

- The ability to customizable the service offering from a CMRS provider's standpoint
  - The ability of a subscriber to enable or disable CPP
  - The ability to allow the calling party to enter a PIN to override CPP
  - The ability to allow the CMRS subscriber to maintain a list of calling numbers for which wireless party pays
- Flexibility in defining the CPP option offered to the CMRS subscriber
- The ability to notify calling parties via an announcement that this call is different
- The ability to verify and validate the "bill to" number of the calling party (by accessing the LIDB)
- The ability to reject non billable calls (offering a variety of calling customer friendly ways to do this)
- The ability to offer payment options to the calling party (Such as billing to the calling number, a credit card, or a calling card)
- Creation of a billable record (formatted, rated, taxed)

It is notable that some of the CPP solution packages end with the creation of a billable record. The CMRS provider *still needs another solution* for billing and collecting for the call. As seen in the discussion of the billing and collections process (illustrated in Figures 7 and 8), this is not a trivial effort.

There will likely be third party billing providers that offer the ability to either handoff a billable record to the CMRS provider's billing agent or to act as the CMRS's billing agent (for an additional charge). However, several of the major LECs have refused to put the CPP billing charges on their bills, which greatly affects the viability of this option.

The main issue for the CMRS provider is twofold: cost of services and impact on the CMRS provider's new *customer*—the calling party. CMRS providers will want a CPP service that can be implemented in a way that is cost effective for them (i.e. it does not cost more to bill

than the revenues generated) and friendly to the calling party (i.e. calling party does not receive multiple bills for one call).

3.3.3.3 Originating Carrier performs billing functions on behalf of a CMRS Provider

A third billing and collections alternative is to have the Originating Subscription Carrier (OSC) perform the billing on behalf of the CMRS provider. The OSC is the carrier that originates the call for their subscriber. It can be an IXC, LEC or CMRS provider. In other words, the calling party has subscribed to a specific carrier and that carrier is the one that originates the call. For example, in the case where a fixed line customer makes a long distance call to a CMRS subscriber, the OSC for that call is the long distance carrier of the fixed line calling party.

Based on this definition, it is easy to see why it makes sense for the OSC to perform the billing and collections process for CPP. As a subscription carrier, they are already sending bills out to their subscribers every month and are billing for their portion of the same calls to the CMRS party today.

Figure 11 illustrates the process whereby the OSC performs some of the billing and collections functions on behalf of the CMRS providers. In this scenario the CMRS providers will need to enter into a contract with the LECs, IXCs and other CMRS providers. This contract would be similar to the existing IXC-LEC contracts and would entail the LEC, IXC or CMRS provider to do billing on behalf of the (terminating) CMRS providers. The determining factor of who would do the billing would be the subscription carrier of the call originator. This is the carrier who was transporting and billing for the other portion of the call anyway.

Under this scenario, the individual CMRS providers could continue to collect, format, rate, and tax the CDRs. They would then send the billable records to the appropriate OSC for invoice creation, bill fulfillment and collections. This may best be done via a "clearinghouse" that would insure that the CMRS providers billing records went to the proper OSC and, in turn, that the money collected by the OSC was transferred to the proper CMRS provider.

The OSC could match up the CMRS billable record with its own billable record and display the call details together (two lines-one page concept). This would be the least expensive from a bill fulfillment standpoint, but will create additional processing requirements to "match the records". As an alternative, the OSC could display the CMRS provider's call detail record on a separate page with other CMRS CPP calls. This would be more expensive from a bill fulfillment standpoint, but less so on other processing.

There are certain aspects of this process that should be discussed including scale, risk, number of bills, willingness of all parties to participate in the process and the cost. The Calling Party Pays Bill Direct Method using the OSC billing alternative has an impact on each of these issues as compared to the other billing alternatives.

Scale

Scale is dramatically improved because the OSCs are already sending bills out to their subscribers for the very same call that is being billed by the CMRS provider (the land line portion of the call). The OSCs would be in the best position from a "scale" perspective to pass on a reasonable rate to the CMRS providers.

Risk

Under the OSC Billing scenario, risk to the CMRS providers is minimized due to the fact that the charges are packaged with other charges from a subscription carrier that the customer is familiar with. Minimizing customer confusion should help to improve collections of the CPP charges.

Single Bill

The OSC Billing scenario is the most customer friendly method. There are multiple charges, but not multiple bills. A call would still be divided on the bill (appear twice) but the invoice would come in the same envelope.

Willingness to Participate in the Process

The OSC billing alternative requires willingness on the party of all carriers to participate in the process. Some LECs have gone on record to say they will not do the billing on behalf of the CMRS providers. It is unclear what the IXC's position would be.

Cost

The existing price range *for billing on behalf of another carrier* may range from $.30 to $1.20 per call detail. If one looks at an average call duration between 1.5 to 2 minutes per call and at CMRS provider charges between $.20 to $.40 per minute of use, it does not take much to see that these billing charges could be uneconomical. On the other hand, the actual incremental cost to the OSCs is substantially lower.

The question becomes how to *persuade* the OSC's to pass these incremental costs on to the CMRS providers (with a reasonable profit margin for providing the service).

Easily Recognizable Number

The use of Easily Recognizable Numbers (ERN) to identify CMRS subscribers who have the CPP option is a significant enabler for this billing alternative. Absent the use of ERNs, the CMRS provider would need to provide the CPP billable record or make the information known to the OSC who performs the billing. This makes the process significantly more complex and therefore more costly.

3.3.4 Summary of the Three Billing Alternatives to the CPP Bill Direct Implementation

Although the objective of the three alternatives discussed in the prior sections is the same (to bill and collect from the calling party) it is important to note that the means to achieve this end can vary dramatically. The specific differences noted for achieving the end are summarized in the table that follows.

Process or Business Issue	**Alternative 1** CMRS's bill on their own behalf	**Alternative 2** Single Service Provider bill on behalf of CMRS's	**Alternative 3** *Originating* Subscription Carriers (OSC) bill on behalf of CMRS's
Collect and Format CDRs	Existing CMRS Process	Existing CMRS process	Existing CMRS process
Rating (During this process incoming calls to CPP customers need to be flagged for downstream processing)	Existing CMRS Process, based on called subscription account	Existing CMRS Process, based on called subscription account	Existing CMRS Process, based on called subscription account
Billing and Invoice Creation	Process must be modified to include obtaining "name and address" information.	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
New Name and Address "Process" (Clearinghouse Required)	A new process must be added to obtain billing name and address info for the calling party	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Clearing house	Needed to facilitate the name and address process.	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Bill Fulfillment (Print and Post)	Existing CMRS process Dis-economies of Scale	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Lockbox	Existing CMRS Process	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Payment Processing	Needs modification to deal with non subscription accounts	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Accounts Receivable (Calling) Customer Level	Needs modification to deal with non-subscription account.	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Account Management (At Customer level)	Needs to be modified for non subscription accounts	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Accounts Receivable (At Summary Level))	Not Required. A/R is at Customer Level.	Need to establish an A/R at some higher level than Customer.	Need to establish a A/R between CMRS and the individual OSC's.
Customer Care (Call Center)	Existing CMRS Process Expect increased call volumes	Performed by 3rd party (for a fee)	Performed by OSC (for a fee)
Number of Bills to Calling Party	Multiple bills to calling party (1 per carrier)	At least one additional bill to the calling party (1 per Service Provider)	No additional bills
New Agreements/Contracts Required	A contract would need to be negotiated with a clearing house to get name and address information from LEC's	The CMRS's need to: • Jointly agree to work use a single service provider • Develop a joint Requirements Document • Execute a vendor selection Process • Negotiate and Sign an agreement with the Vendor	• The CMRSs need to enter into agreements with the OSCs • The OSCs need to be willing to enter into these agreements at reasonable costs
Financial Risk to CMRS (terminating)	Higher risk of bad debt	Higher risk of bad debt	Low (Charges are packaged with other subscription calls)
Cost Impact	• New Clearinghouse Costs • Higher Bill Fulfillment Cost • Customer dissatisfaction at multiple bills • Increased calls to Call Center • System modifications to accommodate new billing	• New Service Provider Costs • Customer Dissatisfaction at extra bill Could be in the range of $4-$8 per bill for service that includes Customer Care functions	• New OSC Costs Can range from $.30 to $1.20 per line of detail on bill

3.3.5 Billing, Collections, and Customer Care under the Sent Paid Model

If one looks at the *Sent Paid* model used by the rest of the world, one can see a very different impact of CPP on the Billing and Collections processes, even for those countries that *converted* their billing paradigm to CPP. One important enabling factor for the Sent Paid Model is the use of Easily Recognizable Numbers. These ERNs are not only helpful to the Calling Party for notification purposes, but also to the downstream systems that need to rate and bill the CPP call properly.

Figure 12 depicts the Billing, Collections, and Customer Care functions in the *Sent Paid* Model. In the US version of this model, there is a need to recognize that today's telecommunications customer usually has two wireline subscription carriers that serve his or her local and long distance needs. Elsewhere in the world, this is not the case. In most other countries, even if subscribers have a choice of long distance carriers, the local fixed wireline carrier manages their account.

If the US were to deploy a sent paid version of CPP, the calling party's *existing* subscription carriers (LEC, IXC or CMRS) responsible for originating the call to the CMRS subscriber would be responsible for not only the billing and collections aspect of the call, but also for the account.

Figure 12 illustrates the exact nature of the billing and collections relationship under the US Sent Paid Model. The OSC provides all of the billing; collection and customer care services to the originating caller. The caller is billed for the CMRS portion (air time) of the call in the same invoice as the landline. The call is billed end-to-end by the OSC and the calling party receives one bill from his OSC for that call.

The mechanism that would manage the relationship between the OSC and the CMRS providers would be an Interconnection Agreement. These agreements would need to be established and broadened to allow for the billing and collection of the higher rated calls to CMRS customers.

As part of the interconnection agreement, two important issues would need to be resolved. First, the rate for the CMRS portion of the call would need to be established. The CMRS provider would determine this. Next, agreement would need to be reached between the OSC and CMRS provider on how this charge would be divided between both parties.

Competition will drive the CMRS providers to offer competitive rates and, while the OSC will need to be compensated for managing the account, they should be able to offer the most competitive rates for these functions. The incremental cost involved could be minimal if the CMRS providers agree to keep the rating and billing simple. This is how carriers in most other countries where CPP has been implemented currently do it.

3.3.6 Economies of Billing Alternatives

The exact costs that CMRS providers will incur to implement CPP (Bill Direct) are unknown at this time. What is known, however, are the general economies of billing services (see Figure 5). Furthermore, CMRS providers do have a good understanding of their current costs for *in*sourcing or *out*sourcing these services today.

A high level view of the underlying economics for the alternative solutions can set a framework for understanding. On the other hand, a look at some existing costs can add specificity to the framework.

Figure 6 " Billing, Collections and Customer Care Unit Costs for CPP (Bill Direct)", illustrate the economies of scale for each of the solutions. There is no question that, with respect to underlying costs, the *Originating Subscription Carrier* solution is the most cost effective of all solutions. The OCS is already billing the Calling Party for the other portion of the call and so the add-on for the additional charge (and the process to get one to that point) should be incremental to an already highly scaled effort. A significant added benefit of this selection is that the caller gets no new bills

The next most economical solution is the joint use of a *3rd Party Service Provider* to perform a number of the services on behalf of all of the CMRS providers. Carriers may select to keep some of the functions themselves to keep cost down, but the key areas for scale are in bill fulfillment. Bill fulfillment, alone, can cost from $.55 to $.75 per bill, with a significant portion coming from postage costs. The downside of this is that the caller gets one extra bill per month for making even one CMRS CPP call. The upside is that they don't get multiple bills as in the next example.

The least economical solution, it would appear, is for the *CMRS* provider who chooses to bill on its own behalf. The economies of scale are against the carrier in this situation because all of the new bills will be incremental bills to the existing process (the called party still gets a bill) plus they will be at high unit cost due to scale issues. A further consideration is that the Average Revenue Per User (ARPU) of these casual subscribers will be lower due to the wider distribution of callers.

In addition, on top of the underlying cost economies for each solution, each new party to the play will be looking for a profit margin. Some of the players may not be interested in making CPP work and may either refuse to play or charge unreasonable rates.

The table that follows provides an overview of some of the current cost ranges for billing and customer care.

Item	Cost
1. Billing Services: CDR collection through bill fulfillment + collections	$1.50 to $3.50 per bill per month
2. Customer Services Relating to Billing and Collections Only	$1.50 to $3.50 per sub per month
3. Subscription Carrier Charges for Billing Services to other carriers	$.30 to $1.20 per call detail record

CMRS providers need to consider that the first two costs provided in the above table are likely to be on the high end of the range, if not higher, for CPP billing. In addition, the third cost element (subscription carrier charges) could result in negative NVP for an average CMRS call of 2 minutes at, say a $.30 cents per minute rate.

In light of this, alternatives 1 (CMRS Performs Billing and Collections) and 2 (Third Party Performs some of the Billing and Collections) would not appear to be economically sound for even the larger CMRS providers. Economic soundness is even more questionable for the small to medium size CMRS providers who are still climbing the scale ladder.

4.0 CPP Implications for Non-Voice Calls and Converging Networks

All discussions have centered on the implications of CPP implementation on network infrastructure as it relates to basic voice calls. Additional complexities are encountered when considering non-voice calls and the convergence of fixed and mobile services.

For purposes of this discussion, non-voice calls are described as data (e.g. messaging, binary data, IP packages, facsimile service, imaging information and multi-media applications). These types of non-voice calls present additional challenges when discussed in terms of CPP implementation. Charges for these calls may be calculated and billed differently from voice calls. In addition, with the convergence of mobile and fixed networks, zone charging often applies as CMRS subscribers move between fixed and mobile applications.

The most challenging effort surrounding the application of a Calling Party Pays situation when considering the rapid evolution to wireless data applications relates to the requirements for Notice to the calling party that the completion of the transaction will result in an additional charge. Once an individual is connected to the Internet, the connected terminal is available to receive requests for multiple simultaneous "sessions". The session is as analogous as possible to a call in the voice circuit connected world. With the bandwith presently supported today, an ISP can support many simultaneous data sessions to a single terminal or server. While the technology may be available in the future to manage a "session introduction," where a terminal could be advised of an attempt to establish a session, who the calling application was, and what "business relationship" pre-existed to approve such a connection, there is nothing available today to support such a capability. It would be advisable to recognize the lack of support for such a critical application and address either a modification of the rules, a specific exception to the rules or a search for workable solutions to address the dynamic growth of data applications.

5.0 Calls, Customer and Transactions not specifically addressed in the White Paper

Much of the White Paper addressed the implications for the network infrastructure of the CPP implementation as contemplated in the CPP NPRM. There was also a discussion of additional complexities involved with non-voice and converging networks. There are additional calls, customers and transactions that were not specifically addressed in this paper and they are provided below. As the CPP proceeding continues, consideration and further analysis might be necessary for this group of calls and transactions.

1. Complex voice calls (e.g. conference calls, CUG)
2. Calls originating from coin phones, hotel/motel and from other like facilities and PBX's.
3. Calls from International Carriers, Independent Telephone Companies and from residences and businesses where it is being billed to a third party.